

REMARKS

Claims 1-3, 5-7, 9-13, 16-20, 22, 24, 34-39, 42, and 55 are pending in the application and rejected under 35 U.S.C. §103(a) over the combination of Gammon (U.S. Patent No. 5,781,865) and Feuerstein et al. (U.S. Patent No. 6,055,230).

Claims 8 and 21 are rejected over the combination of Gammon/Feuerstein et al. as further modified by Reudink et al. (U.S. Patent No. 5,889,494).

Claims 14-15, 23-24 and 40-41 are rejection under the combination of Gammon/Feuerstein et al. as modified by Roberts et al. (U.S. Patent No. 4,845,504).

Claim 43 is rejected over the combination of Gammon/Feuerstein et al. as modified by Struhsaker et al. (U.S. Patent No. 6,188,912).

SECTION 103 REJECTIONS

The Applicants submit herein that the claims have been further amended and clarified to define over the cited art, and currently recite unique combinations of elements that are not taught or suggested by the cited art. Accordingly, the claims are not rendered obvious by the cited art in their current form.

More specifically, the Applicants have amended the claims to clarify them along the lines previously discussed in an Interview with the Examiner, and also as noted in the most recent Office Action. The independent claims have been amended to recite that the antenna has an array of elements arranged in columns of multiple elements, wherein individual beams are defined by controlling elements of the columns for handling signals of at least two individual service providers.

Furthermore, the independent claims have been amended to recite that at least one of the defined beams is steerable in at least one of azimuth and elevation. As such, the Applicants submit that the claims are in an allowable form.

Claim Rejections Based on Gammon/Feuerstein et al.

Of the claim set rejected over this combination of elements, claims 1, 16, 34 and 55 are independent claims. The other claims are dependent.

As noted above, claim 1 has been amended to recite a system for sharing a cellular tower among multiple service providers comprising an antenna having an array of elements arranged in columns of multiple elements and operable to define multiple, individual beams, by controlling elements of the columns, for handling signals of at least two individual service providers. In addition to other elements, signal processing circuitry is recited, which processes signals associated with the individual service providers, and which also drives the antenna to define each individual beam for at least individual service provider, with at least one of the defined beams being steerable in at least one of azimuth and elevation.

The Applicants still disagree with the Examiner's position that the Gammon/Feuerstein et al. combination discloses digital signal processing circuitry that processes the common digital IF band, such that a separate band portion is defined for the individual service provider, and which also simultaneously drives the antenna to define at least one individual beam for each individual service provider. The Applicants submit that certainly the cited combination does not teach the invention recited in claim 1 including the array elements and columns where

individual beams are defined by controlling the elements of the columns, nor does the combination of references teach or suggest that at least one of the defined beams is steerable in at least one of azimuth and elevation. Accordingly, claim 1 is allowable over that cited art. The remaining pending claims 2-3, and 6-13 each depend from claim 1 and further recite a unique combination of elements that are not rendered obvious by the Gammon/Feuerstein et al. combination.

Independent claims 16, 34 and 55 have also been amended to recite limitations involving the antenna having an array of elements arranged in columns of multiple elements wherein individual beams are defined by controlling elements of the columns and wherein at least one of the defined beams is steerable in at least one of azimuth and elevation. Accordingly, for reasons similar to those discussed above, the Applicants submit that independent claims 16, 34 and 55 are also in an allowable form and are not rendered obvious by the Gammon/Feuerstein et al. combination.

Furthermore, various dependent claims, such as claims 17, 19-22 that depend from claim 16, and 37-43, which depend from claim 34, and recite unique combinations of elements or processing steps that are not taught or rendered obvious by the present invention. Accordingly, the Applicants submit that those claims are also in an allowable form.

Claim Rejections Based on Gammon/Feuerstein et al./Roberts et al.

Claims 14-15, 23-24 and 40-41 have been canceled and, thus, rejection of those claims is moot. However, the Applicants submit that the currently pending

claims would not be rendered obvious by the Gammon/Feuerstein et al./Roberts et al. combination. The Roberts et al. reference is directed to 16 separate antenna towers that are directed to a beam steering network. While teaching beam steering, such steering for each antenna tower is addressed by variable phase delay networks. There is no teaching at all with respect to a signal processing circuitry that processes channel signals associated with an individual digital IF band for a specific service provider which simultaneously drives the antenna to define at least one individual beam for each service provider with at least one of the defined beams being steerable in at least one of azimuth and elevation. As previously noted in this case, the present invention is directed to allowing the sharing of a cellular tower among multiple service providers by handling all of those service providers in a single common RF band, which is then converted to a common digital IF band that represents the signals of the various service providers. Then through signal processing circuitry, the individual digital IF band portions corresponding to the individual service providers are processed while the digital processing circuitry simultaneously drives the antenna to define individual steerable beams for one or more of the service providers. Therefore, even putting all of the references together would not yield all the elements recited in the claims.

Furthermore, it is unlikely that a person of ordinary skill in the art would even make such a combination. While the Gammon reference is directed to handling multiple providers in a single cell site, it does so by simply splitting the RF signals and directing them to equipment associated with each of the single providers. There is no discussion whatsoever or any teaching in Gammon of converting the RF band

to a digital IF band. In fact, Gammon relies upon the fact that the band is an RF band that is passed through an RF splitter. Therefore, conversion to a digital IF band would essentially render Gammon inoperable. Even if Feuerstein et al. was properly combined such that digital signal processing would be utilized, the Roberts et al. reference would require conversion back to RF as it relies upon RF phase shifters for the purpose of beam steering. this would not be a design path chosen by a person of ordinary skill in the art. Thus, the combination of references teaches in the opposite direction of the present invention, which utilizes signal processing circuitry for not only processing individual digital IF signals, but also provides simultaneously driving the antenna to define at least one individual beam for each individual service provider wherein at least one of the defined beams is steerable and at least one of azimuth and elevation. Accordingly, the Applicants submit that to a person of ordinary skill in the art the combination of Gammon/Feuerstein et al./Roberts et al. would not render obvious the invention as recited in the independent claims 1, 16, 34 and 55.

Claims Rejected Over Gammon/Feuerstein et al./Reudink et al.

Claims 8 and 21 are rejected under a combination of elements which includes the base references as combined with the Reudink et al. reference. Reudink et al. is merely recited as teaching beams that might be oriented in different directions. As such, the combination of references that includes Reudink et al. does not address the shortcomings in the cited art as noted above, such that the three-reference combination would render obvious claim 8, which depends from claims 1,

or claim 21, which depends from claim 16. Accordingly, those claims are also in an allowable form.

Claim Rejections over Gammon/Feuerstein et al./Struhsaker et al.

Claim 43 is rejected over Gammon/Feuerstein et al./Struhsaker et al. The Struhsaker et al. reference is recited to teach some element with respect to microwave backhaul. However, the Struhsaker et al. reference does not provide the necessary teaching such that when combined with Gammon/Feuerstein et al., it would render obvious the invention recited in claim 34, from which claim 43 depends. Accordingly, the Applicants submit that claim 43 is also in an allowable form.

CONCLUSION

Applicants submit that the currently pending claims are in an allowable form and, therefore, requests a Notice of Allowability of the application at the Examiner's earliest convenience. If any issues remain in the case which might be handled in an expedited fashion, such as through a telephone call or an Examiner's Amendment, the Examiner is certainly encouraged to telephone the Applicants' representative or to issue an Examiner's Amendment.

The Applicants know of no fees due with this submission. However, if any charges or credits are necessary, please apply them to Deposit Account 23-3000.

Respectfully submitted,

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